1. Other valid documentation

Following documents are available at our website. Only current documents are valid at our website.

- Catalogue
  drawings, performance data, information on accessories etc.
- General terms and conditions
  Information about warranty

2. Intended use

Gripper can only be used in mint condition, with original accessories, unauthorized alterations are excluded from manufacturer‘s liability and it has to be within its defined parameters.
Zimmer GmbH doesn‘t accept liability for any possible damages if intended use isn‘t considered.

Gripper has exclusively been designed for electric application of a supply voltage of 24V.
The gripper can be applied for limited gripping, handling and holding in enclosed spaces. It is not suitable for clamping work pieces during processing and for direct interaction with perishable products.

3. Function

A current impulse can set the integrated drive of the plunger coil in motion. Generated travelling distance is transferred to gripper jaws via kinematics and results in lifting.
NC is suitable for exterior gripping -><- and NO is suitable for interior gripping <--> .

4. Staff qualification

Assembling, start-up and maintenance can only be carried out by trained staff. It is essential that these people should have read and understood the assembly instructions and handbook.

5. Assembly

5.1 Information about possible dangers when installing the gripper

ATTENTION! While ignoring system failure can be caused by gripper
Bevore carrying out assembly, installation and maintenance work, always switch off the power supply to the electronics.

5.2 Assembly gripper

Gripper can be assembled on several sides according to its mounting surface specifications on evenness.

For assembling the gripper following work steps have to be conducted:
- Cylinder pins have to be inserted in fit feature of the gripper
- Gripper has to be positioned by means of cylinder pins on the surface
- Gripper has to be fastened with cylinder head screws of property class 8.8
- upply cable KAG1000B8 (plug straight) or KAW1000B8 (plug angle) has to be assembled

Data for evenness, tightening torque and screw diameter are mentioned under point 13 according to its technical data.

5.3 Assembly gripper jaws

Before assembling gripper jaws, weight and length has to be checked with regard to its selected gripper type.

For assembling gripper jaws following work steps have to be conducted:
- Centre sleeves have to be inserted in fit feature of gripper jaws
- Gripper jaws have to be positioned by means of centre sleeves on gripper jaws
- Gripper jaws have to be fastened with cylinder head screws of property class 8.8

Data for tightening torque, screw diameter, maximum weight and length of gripper jaws are mentioned under point 13 according to its technical data.

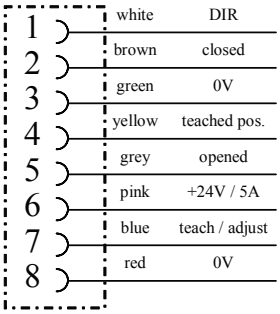
6. Start-up

6.1 Drive

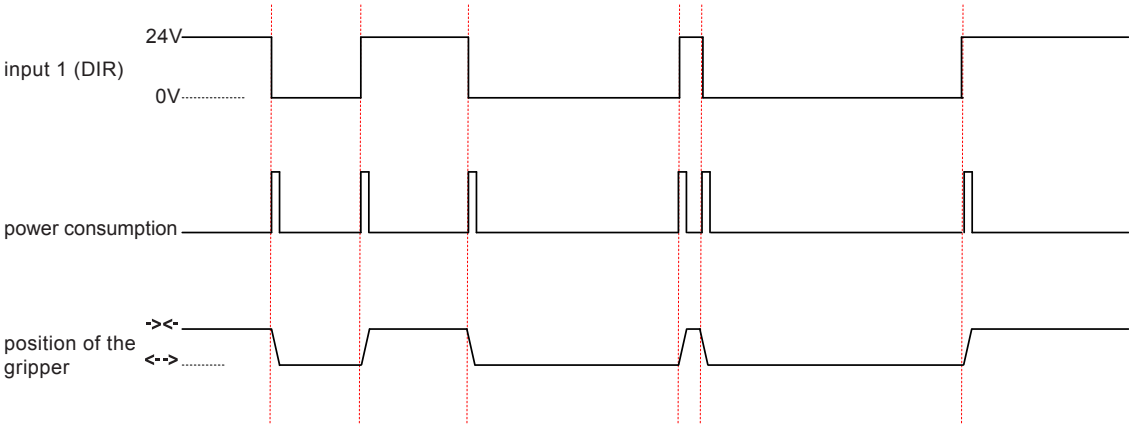
For the application of the gripper, power supply is needed at input 3 and 8 (0V) and as well as input 6 (+24VDC/5A). Input 1 (DIR) serves as control input of the gripper. It can be opened and closed with regard to this control unit. The input signal 1 (DIR) has to be activated as long as a reverse movement of gripper jaws is needed. Current consumption during the procedure of gripper jaws is around ≤ 5A. During stand-by mode, current consumption of gripper is around 0,02A.

PIN	Colour	Function	Description
1	white	DIR	IN control input gripper open / close 24VDC
2	brown	closed	OUT message gripper closed
3	green	GND	Power supply 0VDC
4	yellow	teached position	OUT message work piece gripped
5	grey	opened	OUT message gripper opened
6	pink	+24VDC	Power supply +24VDC / 5A
7	blue	teach / adjust	IN programming
8	red	GND	Power supply 0VDC

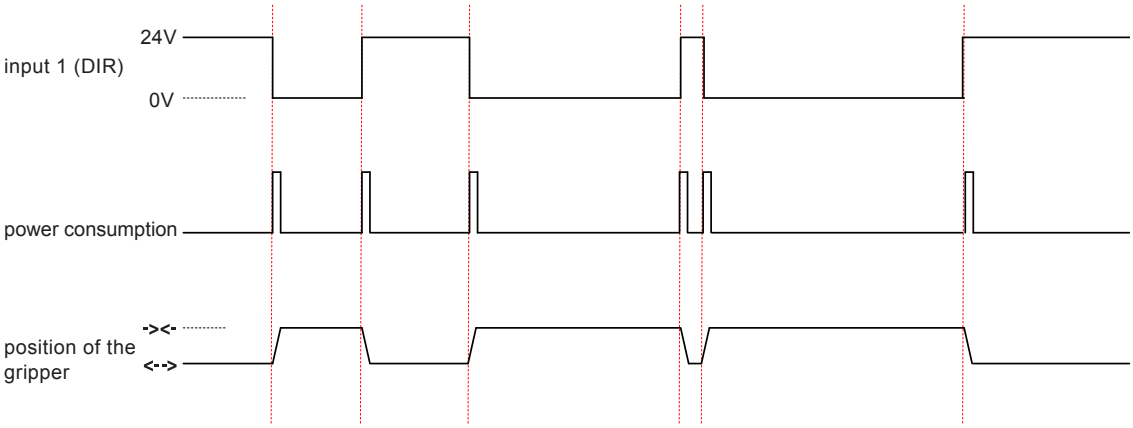
Cables



6.2 Plan of procedures NC version



6.3 Plan of procedures NO version



7. Maintenance

7.1 Maintenance intervals

Maintenance intervals of 30 million cycles can be decreased in following situations:
- dirty environment
- if gripper is not used according to its performance data and according to its regulations

Gripper has to be greased with following lubricant. This is an essential part of regular maintenance:
- mechanics: Molykote BR2plus

7.2 Dissemble gripper

It is recommended to maintain all products by Zimmer GmbH repair's service. If gripper is assembled or dissembled unauthorized, complications may come up due to the fact that special assembling fixtures are required.

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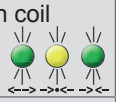
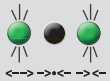
8. Troubleshooting

8.1 LED display

8.2 Fault diagnosis

Error	Possible causes	Troubleshooting
Temperature out of range LED display blinks	Adaptor plate is manufactured of a material with less thermal conductivity	Heat conduction of adaptor plate can be altered by improving materials
	Ambient temperature too high	Sufficient air ventilation is essential
Positioning of sensor defect, no current in coil LED display blinks 	Electric power supply malfunctioning	Supply cable has to be checked on error. Aligned current and voltage has to be checked. Gripper has to be send in for inspection
Voltage out of range LED display blinks	Electric power supply malfunctioning	Supply cable has to be checked on error. Aligned current and voltage has to be checked. Gripper has to be send in for inspection
Programmed gripper position cannot be identified LED display blinks 	Work piece tolerance out of requested range	Position of gripper has to be programmed once again
	Gripper jaws have to be clamped	Re-lubricate Check evenness of mounting surface Adjust length of gripper jaws
Grip force is not reached	Spring fracture	Gripper has to be send in for inspection
	Dirt, deficient lubrification	Clean guide and re-lubricate
Gripper jaws do not move	Electric power supply malfunctioning	Supply cable has to be checked on defects Aligned current and voltage has to be checked
	Damage of one or more functional parts due to overload	Gripper has to be send in for inspection
	Spring fracture	Gripper has to be send in for inspection
Signals in end position are not displayed	end position lies out of the pre-set range	Calibration of the end positions via automatic running procedure
	Supply cable defective	Supply cable has to be changed
	Integrated hall sensor defective	Gripper has to be send in for inspection

8.3 Status table

There is no signal during current feed of coil and until stabilization of position.

Condition	output			LED display blinks		
	opened	teached position	closed	opened <-->	teached position –>•<–	closed –><–
Programmed grip position cannot be found	I	0	I	I	0	I
position sensor defective	I	I	I	I	I	I
No coil current	I	I	I	I	I	I
Temperature out of range	I	I	0	I	I	0
Voltage out of range	0	I	I	0	I	I

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9. Accessory / scope of delivery

The function of the gripper is not guaranteed while using non authorized accessories of Zimmer GmbH. Accessories of Zimmer GmbH are particularly tailored to every gripper.

Optional accessories can be found at www.zimmer-group.de.

10. Sensor technology

10.1 Detection of the intermediate position

The intermediate position, also called „workpiece gripped“ can be programmed freely. For this purpose, a signal (+24V) is fed in the input 7 (teach / adjust) for maximum 3 seconds.
The feedback to the process is given via output 4 (teached position).
This status is visualized at the gripper via LED display.

10.2 Detection of the end positions

The end position sensing of the gripper is preset by manufacturer. On request, the end positions can be reset with the help of an automatically running procedure. For this purpose, at input 7 (teach / adjust) a signal (+24V) has to be fed in for at least 10 seconds. After 3 seconds, the procedure will start and ends after 20 gripping cycles. Should the signal (+24V) be interrupted during the running procedure, the new end positions are not saved in the internal control unit.
The feedback of the end positions is given via output 2 (closed) and 5 (opened).
This status is visualized at the gripper via LED display.

10.3 LED display

10.4 Status table

There is no signal during current feed of coil and until stabilization of position.

Condition	output			LED display		
	opened	teached position	closed	opened <-->	teached position –>•<–	closed –><–
opened	I	0	0	I	0	0
closed	0	0	I	0	0	I
programmed grip position „teached position“	0	I	0	0	I	0

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11. Declaration of incorporation according to EU directive 2006/42/EG on machines (annex II 1 B)

Name and address of the manufacturer:
Zimmer GmbH
Im Salmenkopf 5
D-77866 Rheinau

We hereby state that the below mentioned imperfect machines

Type designation: Grippers electrical

Type of designation:

GEP9002NC-B	GEP9002NO-B	GEP9004NC-B	GEP9004NO-B

are in accordance with essential requirements on machine directive 2006/42/EG
Nr.1.1.2., Nr.1.1.3., Nr.1.1.5., Nr.1.3.2., Nr.1.3.4., Nr.1.3.7., Nr.1.5.3., Nr.1.5.4., Nr.1.5.8., Nr.1.6.4., Nr.1.7.1., Nr.1.7.4.

Furthermore, we declare that all special technical data is according to directive's annex VII part B.
We undertake to transfer electronically specific data about incomplete machines by our documentation department due to reasoned statements of the institution for market surveillance.
The incomplete machine can only be commissioned if the machine or plant in which the incomplete machine is installed is according to machine requirements of EU 2006/42/EG and if the EC Declaration of Conformity is issued according to annex II 1 A.

Authorized person for compiling relevant technical data

Kurt Ross	See address of manufacturer
First name urname	Address

Ettlingen, 22.10.2013	Martin Zimmer
(Date and place for issuing)	(legally binding signature)
	Managing partners

12. Declaration of Conformity according to EU directive 2004/108/EG on Electro-magnetic Compatibility (EMC)

Name and address of the manufacturer:
Zimmer GmbH
Im Salmenkopf 5
D-77866 Rheinau

We hereby state that the products mentioned below

Type designation: Grippers electrical

Type of designation:

GEP9002NC-B	GEP9002NO-B	GEP9004NC-B	GEP9004NO-B

are in accordance with following norms and normative documents of the EMV directives 2004/108/EG

EN 61000-6-2: 2005	Electro-magnetic Compatibility (EMC) – part 6-2: generic standards; immunity, industrial sector
EN 61000-6-4: 2007	Electro-magnetic Compatibility (EMC) – part 6-4: generic standard, transient emissions; industrial sector

Ettlingen, 22.10.2013	Martin Zimmer
(Date and place for issuing)	(legally binding signature)
	Managing partners

13. Technical data

Series GEP9000

	GEP9002NC-B	GEP9002NO-B	GEP9004NC-B	GEP9004NO-B
Installation position	user-defined	user-defined	user-defined	user-defined
Permissible unevenness of mounting surface [mm]	<0.02	<0.02	<0.02	<0.02
Mounting gripper / tightening torque [Nm]	M3/1.5	M3/1.5	M4/3	M4/3
	M4/2.8	M4/2.8	M5/6	M5/6
Replacement accuracy [mm]	<0.2	<0.2	<0.2	<0.2
Lift per jaw [mm]	2	2	4	4
Grip direction	-><	<-->	-><	<-->
Grip force in grip direction minimum [N]	7	7	14	14
Grip force in grip direction maximum [N]	10	10	26	26
Number of cycle continuous operation maximum [cycle/min]	200	200	200	200
Number of cycle maximum [cycle/min]	250	250	250	250
Operating time [ms]	<20	<20	<30	<30
Repeatability +/- [mm]	0.05	0.05	0.05	0.05
Length gripper jaws maximum [mm]	40	40	50	50
Weight per gripper jaw maximum [g]	20	20	30	30
Mounting gripper jaws / tightening torqu [Nm]	M2.5/1	M2.5/1	M3/1.5	M3/1.5
Maximum acceptable static force and torque				
Mr [Nm]	3	3	2.7	2.7
Mx [Nm]	5	5	2.7	2.7
My [Nm]	3	3	4.3	4.3
FA [N]	150	150	336	336
Pulse time ->< [ms]	7	25	9	35
Pulse time <--> [ms]	25	7	35	9
Debounce time [ms]	10	10	10	10
Current consumption per pulse maximum [A]	5	5	5	5
Current consumption in a stand-by mode [A]	0.02	0.02	0.02	0.02
Cable length maximum [m]	10	10	10	10
Protection class	IP40	IP40	IP40	IP40
Approval	CE	CE	CE	CE
Noise level [db(A)]	<70	<70	<70	<70

Service temperature [°C]	10 up 50
Storage temperature [°C]	-10 up 50
Maintenance interval [cycles]	up to 30 million

Raw material information	
Housing	aluminium, anodized
Gripper jaws	hard-coated Al - alloy, anodized
Screws	steel, corrosion-resistant
Electronics	RoHS - conform

Weight [kg]	0.25	0.25	0.57	0.57

Forces and moments